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| EXAMINER | |
|---|---|
| CHUO, TONY SHENG HSIANG | |
| ART UNIT | PAPER NUMBER |
| 1795 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/790,627 | MATHIOWETZ ET AL. | |
| | Examiner | Art Unit | |
| | TONY CHUO | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *03 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Claims 1-23 are currently pending. New claims 20-23 have been added. The amended claims do not overcome the previously stated 102 and 103 rejections. Therefore, upon further consideration, claims 1-23 are rejected under the following 102 and 103 rejections.

### *Drawings*

2. The drawing filed on 12/3/07 is accepted by the examiner.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation.

The Ura reference discloses a case for temperature regulation of an electrical energy storage cell comprising: a first layer that is a heat dissipating portion "4a" that is shaped to conform to a cylindrical portion of an outer surface of cell "2", wherein the heat dissipating portion terminates at first layer ends that are on the cylindrical portion of

the outer surface of the cell and has a thickness of approximately 0.3 mm; and a second layer that is a resin made pack case "1" that is shaped to cover an outer surface of the first layer and that extends beyond the outer surface to completely cover the first layer ends and that exhibits poor thermal conductivity (See Figure 1 and 2 and paragraphs [0025]). It also discloses heat dissipating portions that are made of aluminum or copper that exhibit excellent thermal conductivity (See paragraph [0022]). It also discloses a battery pack that has a maximum temperature of the cells that is 43°C (See paragraphs [0034],[0036]).

Examiner's note: It is inherent that the first and second layers have known thermal conductivities values because the materials are known. The limitation "a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being an inherent property of a battery cover because if Ura battery cover was tested during a short circuit condition of the battery, it would inherently have a temperature classification that specifies an outer surface temperature. It is also inherent that when the battery produces heat at a hot spot during short circuit, the first layer of material would spread flow of heat over a portion of the outer surface of the first layer that is larger than the hot spot and the second layer of material would retard the flow of heat to an outer surface of the second layer. It is also inherent that a cover consisting of a first layer that is a aluminum or copper layer exhibiting excellent thermal conductivity and a second layer that is a resin case exhibiting poor thermal conductivity would retard the flow of heat to an outer surface such that the temperature of the outer surface of the

resin case has a measured maximum temperature of 130 degrees centigrade or less during a short circuit condition.

5. Claims 12 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Stafford et al (US 5763118).

The Stafford reference discloses a process of covering the battery comprising: providing a battery cell "22"; covering a cylindrical portion of an outer surface of the battery with a first heat-conductor layer "42" that conforms with the cylindrical portion of the outer surface of the battery, wherein the first layer terminates at first layer ends on the outer cylindrical portion and has a thickness of 0.04 inches and a thermal conductivity of greater 160 watts/meter-°K; and providing a second structural support outer layer "48" that completely covers the first heat-conductor layer, wherein the second layer has a thickness of 0.02 inches (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24 and Figures 1 and 3). It also discloses a first heat-conductor layer that comprises two thermally conductive half-shells "26a" & "26b" that each cover one side of a round surface of the battery (See column 4, lines 18-19).

Examiner's note: The first layer ends are construed as being the portions of the first heat conductor layer that form the interface between the two half-shells. The limitation "to conform the cover to a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being intended use. It is further noted that although Stafford et al does not explicitly teach using the battery during a short circuit condition, a recitation of intended use of the claimed invention must result in a structural difference

between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Since Stafford et al teaches selecting a first and second layer thicknesses and thermal conductivities to achieve high heat-removal efficiency of the battery, it would be inherent that during a short circuit condition, the first and second layer thicknesses and thermal conductivities would be selected to conform the cover to a combustible atmosphere temperature classification that specifies an outer surface temperature.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Toyoda (JP 2001-243927). The Ura reference is applied to claim 1 for reasons stated above.

However, Ura et al does not expressly teach a second layer of material that is heat-shrink tubing or an elastic material. The Toyoda reference discloses a heat shrink member "8" that covers a battery (See paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery cover to include a second layer

of material that comprises heat-shrink tubing or elastic material in order to improve the reliability of the outer package of the battery while simplifying the manufacture of the battery.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Koehler et al (EP 0177225). The Ura reference is applied to claim 1 for reasons stated above.

However, Ura et al does not expressly teach a first layer that comprises two thermally conductive half-shells that each cover one side of a round surface of the energy storage cell. The Koehler reference discloses a cooling system for batteries that comprises cooling panels "15" & "16" that form thermally conductive half shells that each cover one side of a round surface of the energy storage cell (See Figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery cover to include a first layer that comprises two thermally conductive half-shells that each cover one side of a round surface of the energy storage cell in order to increase the surface area of the heat dissipating portion that contacts the energy storage cells such that the thermal efficiency of the heat dissipating portion is increased.

9. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194).

The Stafford reference discloses a battery comprising: a plurality of battery cells "22", wherein each cell is covered by a first heat-conductor layer "42" that is shaped to

conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell and a second structural support outer layer "48" that is shaped to conform to and completely covers the outer surface of the first heat-conductor layer (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24, and Figures 1, 3, & 5). It also discloses electrical contacts "34" (See column 4, lines 9-10).

Examiner's note: The first layer ends are construed as being the portions of the first heat conductor layer that form the interface between the two half-shells. The limitation "a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell" is construed as being an inherent property of a battery cover comprising a first layer that has a first thickness and high thermal conductivity and a second layer that has a second thickness and poor thermal conductivity.

However, Stafford et al does not expressly teach a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device. The Miller reference discloses a multicell battery comprising: a plurality of electrical energy storage cells "24'" & "26'"; a protective device including a fusible link "64" and electrical interconnections "50" that interconnect the plurality of electrical energy storage cells in series circuit with the protective device and the electrical connection leads; and a plastic

resin shell "22" shaped to receive the plurality of covered cells and the protective device (See Figure 1 and 3 and column 3, lines 39-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device in order to provide an overcurrent protection device and outer case that are easily and economically constructed.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194) as applied to claims 9 and 10 above, and further in view of Maggert et al (US 6724170).

However, Stafford et al as modified by Miller et al does not expressly teach a plastic resin shell that includes plastic resin separation bars positioned between the cells and the electrical interconnections to reduce shorting. The Maggert reference discloses a plastic casing "202" positioned between the cells and the electrical interconnections to prevent tabs from shorting (See column 3 line 66 to column 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Miller battery pack to include separation bars in the plastic resin shell in order to prevent the tabs from shorting to either tabs or other cell housings.

11. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Dansui et al (US 2003/0013009). The Stafford reference is applied to claim 12 for reasons stated above.

However, Stafford et al does not expressly teach a first layer of material that comprises aluminum or copper. The Dansui reference discloses a battery housing that is made of aluminum or copper (See paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Toyoda (JP 2001-243927). The Stafford reference is applied to claim 12 for reasons stated above.

However, Stafford et al does not expressly teach a second layer of material that is heat-shrink tubing. The Toyoda reference discloses a heat shrink member "8" that covers a battery (See paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford housing support to include a second layer of material that comprises heat-shrink tubing in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Iwasaki et al (US 6325611). The Ura reference is applied to claim 1 for reasons stated above.

However, Ura et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery pack to include a hot spot on the storage cell during an external short circuit in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194) as applied to claim 9 above, and further in view of Iwasaki et al (US 6325611).

However, Stafford et al as modified by Miller et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Miller battery to include a hot spot on the storage cell during an external short circuit in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Iwasaki et al (US 6325611). The Stafford reference is applied to claim 12 for reasons stated above.

However, Stafford et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery to include a hot spot on the storage cell during an external short circuit in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

16. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194), and further in view of Maggert et al (US 6724170).

The Stafford reference discloses a battery pack comprising: eight battery cells "22" each cell being covered by a first heat-conductor layer "42" that conforms to the

cylindrical portion of an outer surface of the battery, wherein the first layer terminates at first layer ends on the outer cylindrical portion of the outer surface of the battery cell and a second structural support outer layer "48" that completely covers the first heat-conductor layer, wherein the second layer is shaped to conform to an outer surface of the first layer (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24 and Figures 1 and 3). It also discloses a generally rectangular structural base "60" that is shaped to provide mechanical support to the plurality of cells arranged side by side in the structural base (See Figure 5).

Examiner's note: The first layer ends are construed as being the portions of the first heat conductor layer that form the interface between the two half-shells.

However, Stafford et al does not expressly teach a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device; a plastic resin shell; and a potting compound that is disposed around the protective device and secures the protective device. The Miller reference discloses a multicell battery comprising: a plurality of electrical energy storage cells "24'" & "26'"; a protective device including a fusible link "64" and electrical interconnections "50" that interconnect the plurality of electrical energy storage cells in series circuit with the protective device and the electrical connection leads; a plastic resin shell "22" shaped to receive the plurality of covered cells and the protective device; and a positive end of cell "24'" that is conventionally filled with an epoxy material up and covering the horizontal portion of tab-fuse "44" for insulation and to provide

support for the tab-fuse (See Figure 1 and 3, column 2, lines 56-60, column 3, lines 39-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device; a plastic resin shell; and a potting compound that is disposed around the protective device and secures the protective device in order to provide an overcurrent protection device and outer case that are easily and economically constructed.

However, Stafford et al as modified by Miller et al does not expressly teach a plastic resin shell that includes plastic resin separation bars positioned between the cells and the electrical interconnections to reduce shorting. The Maggert reference discloses a plastic casing "202" positioned between the cells and the electrical interconnections to prevent tabs from shorting (See column 3 line 66 to column 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Miller battery pack to include separation bars in the plastic resin shell in order to prevent the tabs from shorting to either tabs or other cell housings.

***Response to Arguments***

17. Applicant's arguments filed 12/3/07 have been fully considered but they are not persuasive.

The applicant argues that Ura et al does not disclose first and second thickness and first and second thermal conductivities of the first and second layers conforming the cover to a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell as presently claimed in claim 1. The examiner disagrees. Ura et al teaches a battery cover that efficiently dissipates the heat generated by the cells. Therefore, during a short circuit of the cells, the temperature classification that specifies an outer surface temperature is a measured property that is inherent of the battery cover.

The applicant also argues that Stafford et al does not disclose selecting the first and second thicknesses and the first and second thermal conductivity of first and second layers to conform the cover to a combustible atmosphere temperature classification that species an outer surface temperature during a short circuit of the battery. The examiner disagrees. Since Stafford et al teaches selecting the first and second thicknesses and the first and second thermal conductivity of first and second layers to achieve high heat-removal efficiency from the battery cell resulting in improved safety of the battery cell, then it would also select the first and second thicknesses and the first and second thermal conductivity of first and second layers to conform the cover to a combustible atmosphere temperature classification that species an outer surface temperature during a short circuit of the battery in order to improve the safety of the battery.

The applicant also argues that neither Stafford et al nor Miller et al taken singly or in combination teach or suggest first and second thicknesses and the first and second

values of thermal conductivity of first and second layers that conform the battery to a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell. As stated above, Stafford et al discloses first and second thicknesses and first and second values of thermal conductivity of first and second layers that are known. In addition, the temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell is construed as being an inherent property of the battery cover. Therefore, there is no evidence to show that the temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell is not an inherent property of a battery cover that has a first layer that has high thermal conductivity and a second layer that has poor thermal conductivity.

***Conclusion***

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY CHUO whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795